

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 39975PC01	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/DK2005/000093	International filing date (day/month/year) 11.02.2005	Priority date (day/month/year) 20.02.2004	
International Patent Classification (IPC) or national classification and IPC INV. G01N21/898 G01N21/88			
Applicant DRALLE ApS et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 3 sheets, as follows:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Box No. I Basis of the report <input type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input type="checkbox"/> Box No. VIII Certain observations on the international application 			
Date of submission of the demand 20.12.2005	Date of completion of this report 22.05.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx. 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer  Krametz, E Telephone No. +31 70 340-2733		

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International application No.
PCT/DK2005/000093

Box No. I Basis of the report

1. With regard to the **language**, this report is based on

- the international application in the language in which it was filed
- a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3(a) and 23.1(b))
 - publication of the international application (under Rule 12.4(a))
 - international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-15 as originally filed

Claims, Numbers

1-12 filed with telefax on 20.12.2005

Drawings, Sheets

1/1 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. The amendments have resulted in the cancellation of:

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- the description, pages
- the claims, Nos.
- the drawings, sheets/figs
- the sequence listing (*specify*):
- any table(s) related to sequence listing (*specify*):

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

**INTERNATIONAL PRELIMINARY REPORT
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International application No.
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims 1-12

No: Claims

Inventive step (IS) Yes: Claims

No: Claims 1-12

Industrial applicability (IA) Yes: Claims 1-12

No: Claims

2. Citations and explanations (Rule 70.7):

see separate sheet

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Re Item V.

1 Reference is made to the following document:

D1 : US 4 913 551 A (DAVIS ET AL) 3 April 1990 (1990-04-03)

D2 : US 6 614 928 B1 (CHUNG YOON SU ET AL) 2 September 2003 (2003-09-02)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

2.2 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document): a method for determining a physical property of an object among a plurality of like objects lying in a side-by-side relationship with each object having opposed first and second end faces (col 3, line 21-28), the method comprising taking a first pair of images of the first end face, so that the first pair of images allow stereo imaging of the object (col 3, line 38-39), taking a second pair of images of the second end face, so that the second pair of images allow stereo imaging of the object (col 3, line 38-39), and using the first and second pair of images for determining the physical property of the object. D1 also mentions to perform the measurement when the objects (logs) are lying on the ground (col 4, line 40-42) which implicitly implies that the objects are lying side-by-side.

The subject-matter of claim 1 therefore differs from this known D1 in that:
the images are taken of the end face and of a predetermined side face of the object using a camera during relative motion between the camera and the object.

The problem to be solved by the present invention may therefore be regarded as to investigate a wider range of physical properties of irregularly shaped objects in a fast and objective way.

The skilled person knows, e.g. from D2 (fig. 1), to reconstruct a 3D-model by using images showing more than one side of the object. Therefore the skilled person would extend the device of D1 in such a way, that not only the end face but also another surface of the object can be seen, especially since D1 mentions imaging of objects lying on the ground (col 4, line 38-43), in which case the top and the end face would be visible. In D1 the images are taken by four identical cameras (1)-(4) (col 4, line 55-56) for recording different parts of an object. It is however generally known to the person skilled in the art to replace several identical cameras each at a different fixed position in respect to an object, these cameras being used to take images of the object, by one single camera and to introduce a relative motion between the camera and the object where circumstances make it desirable.

3 INDEPENDENT CLAIM 10

3.1 Independent claim 10 contains the same features as claim 1 and for the same reasons as claim 1 claim 10 is not inventive.

4 DEPENDENT CLAIMS 2-9, 11, AND 12

4.1 Dependent claims 2-9, 11, and 12 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT), the reasons being as follows:

4.1.1 Claims 2 and 9: D1 shows the measurement of logs with stereo imaging (col 3, line 38-39) using a pair of cameras (col 4, line 38-40).

4.1.2 Claim 3: To choose the upper side is merely one of several possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill.

4.1.3 Claim 4: The skilled person would regard it as a normal design procedure to make a series of images if there is a plurality of objects.

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4.1.4 Claims 5 and 6: To move either the camera attached to a vehicle or the objects to be imaged are the only two alternatives from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill.

4.1.5 Claim 7: D1 shows to take a pair of images using a pair of cameras (fig 1).

4.1.6 Claim 8: To use a single camera instead of a pair of cameras is merely another straightforward possibility.

4.1.7 Claim 9: D1 shows the measurement of the length or the volume of logs (col 3, line 21-28).

4.1.7 Claims 11 and 12 correspond to claims 5 and 6.

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Claims:

1. A method for determining a physical property of an object among a plurality of like objects lying in a side-by-side relationship with each object having opposed first and second end faces and a side face extending between the first and second end faces, the method comprising
 - taking a first pair of images of the first end face and of a predetermined portion of the side face of the object, so that the first pair of images allow stereo imaging of the object,
 - taking a second pair of images of the second end face and of the predetermined portion of the side face of the object, so that the second pair of images allow stereo imaging of the object,
 - the first and second pairs of images being taken using a camera during relative motion between the camera and the object, and
 - using the first and second pairs of images for determining the physical property of the object.
2. A method according to claim 1 wherein the objects are logs or pieces of processed wood.
3. A method according to claim 1 or 2 wherein the predetermined portion is the upper side of the object.
4. A method according to any one of claims 1-3, wherein a first series of first pairs of images is taken that allow stereo imaging of the plurality of objects, and a second series of second pairs of images is taken that allow stereo imaging of the plurality of objects.
5. A method according to claim 4, wherein the first and second series are taken with the camera attached to a vehicle that is moved relative to the plurality of objects.

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6. A method according to claim 4, wherein the first and second series are taken with the camera being stationary and moving the plurality of objects relative to the camera.

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7. A method according to any one of claims 1-6, wherein each pair of images is taken using a pair of cameras.

8. A method according to any one of claims 1-6, wherein each pair of images 10 is taken using a single camera.

9. A method according to any one of claims 2-8, wherein the physical property is selected from the group comprising length, diameter, volume, shape, curvature, surface irregularities, species of tree, percentage of bark, 15 percentage of wood, damage, percentage of rot.

10. A system for determining a physical property of an object among a plurality of like objects lying in a side-by-side relationship with each object having opposed first and second end faces and a side face extending 20 between the first and second end faces, the system comprising
- a camera for taking first and second pairs of images of the first and second end faces, respectively, and of a predetermined portion of the side face of the object, so that each of the first and second pairs of images allows stereo imaging of the object,
25 - the camera being arranged to take the first and second pairs of images during relative motion between the camera and the object, and
- means for using the first and second pair of images for determining the physical property of the object.

30 11. A system according to claim 10 wherein the camera attached to a vehicle that is movable relative to the plurality of objects.

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12. A system according to claim 10 wherein the camera is stationary and the plurality of objects are movable relative to the camera.